

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-56. (Canceled)

57. (New) An optical polarization beam splitter comprising:
- a first optical fiber having an end defining a first optical axis;
 - a second optical fiber having an end defining a second optical axis;
 - a third optical fiber having an end defining a third optical axis parallel to and spaced apart from said second optical axis;
 - a collimating lens disposed along said first optical axis positioned to form a collimated optical beam from said first optical fiber;
 - a focusing lens disposed along a path of said collimated optical beam; and
 - a birefringent walk-off crystal comprising:
 - a first face adjacent to said focusing lens, said first face located at a focal plane of said focusing lens with an angle to said first optical axis to reduce an optical reflection; and
 - a second face in contact with said ends of said second and third optical fibers; and
 - a thickness between said first and second faces, wherein said thickness and said angle of the first face are selected such that a walk-off distance between the first component and the second component substantially matches a spacing

between the second and third optical fibers, wherein a first component of said optical beam having a first polarization exiting said crystal at said second face enters said end of said second optical fiber along said second optical axis and a second component of said optical beam having a second polarization orthogonal to the polarization of said first polarization exiting said crystal at said second face enters said end of said third optical fiber along said third optical axis.

58. (New) The optical polarization beam splitter of claim 57 wherein said second and third optical fibers are polarization maintaining fibers.

59. (New) The optical polarization beam splitter of claim 57 wherein said second optical axis and said third optical axis are spaced apart by a distance of less than 2 mm.

60. (New) The optical polarization beam splitter of claim 57 disposed in a package having a length of less than about 50 mm and a diameter of less than about 10 mm.

61. (New) The optical polarization beam splitter of claim 57 disposed in a package having a length of no more than about 20 mm and a diameter of no more than about 5.5 mm.

62. (New) An optical polarization beam splitter comprising:
- a first optical fiber having an end defining a first optical axis;
 - a second optical fiber having an end defining a second optical axis;
 - a third optical fiber having an end defining a third optical axis parallel to and spaced apart from said second optical axis;
 - a collimating lens disposed along said first optical axis positioned to form a collimated optical beam from said first optical fiber;
 - a focusing lens disposed along a path of said collimated optical beam;
 - a birefringent walk-off crystal oriented such that said first optical axis is not normal to the crystal, the crystal comprising:
 - a first face adjacent to said focusing lens said first face located at a focal plane of said focusing lens with an angle to said first optical axis to reduce an optical reflection;
 - a second face in contact with said ends of said second and third optical fibers;
 - a thickness between said first and second faces selected such that a first component of said optical beam having a first polarization exiting said birefringent walk-off crystal at said second face enters said end of said second optical fiber along said second optical axis and a second component of said optical beam having a second polarization orthogonal to the polarization of said first polarization exiting said crystal at said second face enters said third optical fiber along said third optical axis; and

wherein said thickness of said crystal and said orientation of said crystal are selected such that said first component and said second component walk off from one another by a distance that substantially matches a spacing between said second and third optical fiber.

63. (New) The optical polarization beam splitter of claim 62 wherein said second and third optical fibers are polarization maintaining fibers.

64. (New) The optical polarization beam splitter of claim 62 wherein said second optical axis and said third optical axis are spaced apart by a distance of less than 2mm.

65. (New) The optical polarization beam splitter of claim 62 disposed in a package having a length of less than about 50mm and a diameter of less than about 10mm.

66. (New) The optical polarization beam splitter of claim 62 disposed in a package having a length of about 36mm and a diameter of about 5.5mm.

67. (New) An optical polarization beam splitter comprising:
- a first optical fiber having an end defining a first optical axis;
 - a second optical fiber having an end defining a second optical axis distinct from said first optical axis;
 - a third optical fiber having an end defining a third optical axis distinct from both said first and second optical axes, said third axis is parallel to and spaced apart from said second optical axis;
 - a collimating lens disposed along said first optical axis positioned to form a collimated optical beam from said first optical fiber;
 - a focusing lens disposed along a path of said collimated optical beam; and
 - a birefringent walk-off crystal having a first face adjacent to said focusing lens and located at a focal plane of said focusing lens with an angle to said first optical axis to reduce an optical reflection and to select a walk-off distance of the crystal that substantially matches a spacing between the second and third optical fibers, and a second face in contact with said ends of said second and third optical fibers.

68. (New) The optical polarization beam splitter of claim 67 wherein said birefringent walk-off crystal is oriented at a non-normal angle to said first optical axis.

69. (New) The optical polarization beam splitter of claim 67 wherein said birefringent walk-off crystal is oriented such that a first component of said optical beam having a first polarization exiting said birefringent walk-off crystal at said second face enters said end of said second optical fiber along said second optical axis, and a second component of said optical beam having a second polarization orthogonal to the polarization of said first polarization exiting said crystal at said second face enters said third optical fiber along said third optical axis.

70. (New) The optical polarization beam splitter of claim 69 wherein said second and third optical fibers are polarization maintaining fibers.

71. (New) The optical polarization beam splitter of claim 69 wherein said second optical axis and said third optical axis are spaced apart by a distance of less than 2 mm.

72. (New) The optical polarization beam splitter of claim 69 disposed in a package having a length of less than about 50mm and a diameter of less than about 10 mm.

73. (New) An optical polarization beam splitter comprising:

- means for defining a first optical axis;
- means for defining a second optical axis distinct from said first optical axis;
- means for defining a third optical axis distinct from both said first and second optical axes, said third axis is parallel to and spaced apart from said second optical axis;
- means for collimating an optical beam disposed along said first optical axis positioned to form a collimated optical beam from said first optical axis defining means;

means for focusing an optical beam disposed along a path of said collimating means; and

means for refracting an optical beam into at least two components having orthogonal polarization components, said refracting means optically coupled with said first, said second, and said third optical axis defining means with an angle to said first optical axis to reduce an optical reflection, said angle selected such that the at least two components walk off by a distance substantially equal to a spacing between the first and second optical axis.

74. (New) The optical polarization beam splitter of claim 73 wherein said refracting means is oriented at a non-normal angle to said first optical axis.

75. (New) The optical polarization beam splitter of claim 73 wherein said second and third optical axis defining means are polarization maintaining fibers.

76. (New) The optical polarization beam splitter of claim 73 wherein said second optical axis and said third optical axis are spaced apart by a distance of less than 2 mm.

77. (New) The optical polarization beam splitter of claim 73 disposed in a package having a length of less than about 50mm and a diameter of less than about 10 mm.

78. (New) An optical polarization beam splitter comprising:

a first fiber ferrule having a first optical fiber;

a second fiber ferrule having a second optical fiber and a third optical fiber;

a birefringent crystal disposed on a face of the second fiber ferrule, the birefringent crystal having a thickness and an incident angle with respect to an optical axis of the first optical fiber, wherein the thickness and the incident angle of the crystal are selected such that a walk off distance of the crystal substantially matches a spacing between the second optical fiber and the third optical fiber;

a collimating lens that produces a collimated beam from an optical beam emerging from the first optical fiber; and

a focusing lens that focuses the collimated beam on a first face of the crystal that is nearest the focusing lens such that a first component of the collimated beam enters the second optical fiber and a second component of the collimated beam enters the third optical fiber.

79. (New) An optical polarization beam splitter as defined in claim 78, wherein the second optical fiber and the third optical fiber are polarization maintaining fibers.

80. (New) An optical polarization beam splitter as defined in claim 78, wherein:
- the first fiber ferrule has a length of about 4 mm and is spaced about 1 mm from the collimating lens, the collimating lens having a length of about 3 mm;
 - the focusing lens having a length of about 3 mm and spaced from the collimating lens by about 2 mm; and
 - the crystal having a thickness in a range of about 1 mm to 2 mm and spaced from the focusing lens by about 1 mm.